

**AMENDMENTS TO THE CLAIMS:**

The Listing of Claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims**

1. – 45. (Canceled)

46. (New) A method for forming a rectifying junction on an alloy-semiconductor material comprising a compound comprising a first component and a second component, the method comprising:

photo-electrochemical removal of the first component of a first portion of the alloy-semiconductor material to form an N-type region enriched in the second component; and

substantially removing the second component from a second portion of the alloy-semiconductor material to form a P-type region enriched in the first component.

47. (New) The method according to claim 46, wherein the step of removing the second component from a second portion of the alloy-semiconductor material comprises chemical etching.

48. (New) The method according to claim 46, wherein the alloy-semiconductor material is selected from the group consisting of CdTe, CdZnTe, HgZnCdTe, and HgCdZnSe.

49. (New) The method according to claim 46, further comprising the step of providing a contact on the P-type region to form a P-I-N rectifying junction.

50. (New) The method of claim 49, wherein the contact is selected from the group consisting of gold, tellurium, and platinum.

51. (New) A method for forming a rectifying junction on an alloy-semiconductor material, the method comprising the steps of:

providing the alloy-semiconductor material having at least a first element and a second element, wherein the alloy-semiconductor has a first region and a second region substantially separated by an intermediate region;

substantially removing the first element from the first region, wherein the removal of the first element from the first region substantially forms a region of substantially enriched material of the second element, and wherein the removal of the first element from the first region substantially forms a negatively doped material in the first region to act as an N-type region;

substantially removing the second element of the second region, wherein the removal of the second element of the second region forms a positively doped material in the second region to act as a P-type region; and

providing a contact on the P-type region, wherein the N-type region, the intermediate region and the P-type region with the contact substantially form a P-I-N rectifying junction.

52. (New) The method of claim 51, wherein the removal of the first element occurs by photo-electrochemical removal.

55. (New) The method of claim 51, wherein the removal of the second element occurs by etching.

52. (New) The method of claim 51, wherein the contact is selected from the group consisting of gold, tellurium, or platinum.

55. (New) The method of claim 54, wherein the contact is provided with either vacuum deposited metal or electrodeless chemical exchange methods.

56. (New) The method of claim 51, wherein the alloy-semiconductor material is selected from the group consisting of CdTe, CdZnTe, HgZnCdTe, and HgCdZnSe.

57. (New) A method for forming a rectifying junction on an alloy-semiconductor, the method comprising the steps of:

- applying an N-type material on a first region of the alloy-semiconductor;
- heating the N-type material on the alloy-semiconductor;
- photo-electrochemical etching the N-type material;
- substantially covering the N-type material for protection;
- chemically etching a second region of the alloy-semiconductor to form P-type material; and
- applying a contact to the P-type material to form a P-I-N rectifying junction.

58. (New) The method of claim 57, wherein the N-type material is removable and conductive.

59. (New) The method of claim 58, wherein the N-type material is Hg-In eutectic paste.

60. (New) The method of claim 58, wherein the photo-electrochemical etching comprises the steps of:

- coating the N-type material with a non-conductive material;
- submerging an electrode in an electrolyte solution;
- connecting the electrode to a positive terminal of the power supply; and
- applying a light source having a median energy approximate to the band gap of the alloy-semiconductor material.

61. (New) The method of claim 57, wherein the contact is selected from the group consisting of gold, tellurium, and platinum.